

MYRIOPODS FROM BEULAH, NEW MEXICO.

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The chilopods and diplopods noted and described in this paper compose a small collection kindly sent me for determination by Prof. T. D. A. Cockerell, to whom I wish here to express my thanks. All were collected at Beulah, N. M., which is at an elevation of about 8,000 feet above sea-level and within the Canadian zone. The forms prove to be largely peculiar, each being easily distinguished from any previously described species. The *Geophilus* is especially interesting.

Lithobius glyptocephalus sp. nov.

Diagnosis.—Angles of the 9th, 11th and 13th dorsal plates produced; articles of antennæ 20; ocelli 16–18 in three series; prosternal teeth 6–6, 7–7; spines of first legs beneath 1, 3, 2, of penult 1, 3, 3, 2, of anal 1, 3, 3, 1; coxal pores 6, 7, 7, 7–6, 7, 8, 8, transverse; length 20 mm.

Description.—Body brown to light-brown, head and posterior dorsal scuta darker, reddish-brown or chestnut; venter paler; legs colored similarly to body, but distal joints, especially the first tarsal, purplish; antennæ chestnut proximally, the terminal portion light-brown; dorsal plates roughened, sparsely pilose, especially caudad; antennæ moderately pilose with stiff hairs.

Head subcordate, slightly wider than long (12:11.5); a strong furrow extending dorso-mesad on each side, each furrow dividing into two branches, the anterior of which curves forward to unite with its fellow of the opposite side just back of the frontal suture, the posterior branches uniting similarly in front of caudal margin of head.

Ocelli in a narrow elongate patch which is widest behind; 16–18 in number, arranged in three series (1+7, 6, 4+1+5, 5, 5); rather large and distinct.

Antennæ short, consisting of 20 articles of moderate length, the ultimate long and pointed at the end.

Prosternal teeth 6–6, 7–7, uniform.

Angles of the 9th, 11th and 13th dorsal plates produced; plates more or less distinctly depressed along the median longitudinal line; posterior margin of principal plates, except 7th, sinuate, posterior margin of 7th straight; principal plates strongly marginate laterally and posteriorly.

Spines of the first legs $\begin{smallmatrix} 0, 0, 3, 2(3), 1 \\ 0, 0, 1, 3, 2 \end{smallmatrix}$; of the penult $\begin{smallmatrix} 1, 0, 3, 1, 1 \\ 0, 1, 3, 3, 2 \end{smallmatrix}$, the claw with one spine; of the anal $\begin{smallmatrix} 1, 0, 3, 1, 0 \\ 0, 1, 3, 3, 1 \end{smallmatrix}$, the claw unarmed; last two coxæ armed laterally with a stout spine.

Coxal pores 6, 7, 7, 6-6, 7, 8, 8, transversely elongate.

Gonopods of female with the claw tripartite, the lateral lobes much reduced, almost minute; basal spines 2-2, stout, clavately thickened distally.

Genital appendages of male short and wart-like, pilose.

Length of body 20 mm.; width of 10th plate 2.6 mm.; length of antennæ 8.1 mm.; of anal legs 8.2 mm.

Remarks.—The description is based upon two adult specimens, a male and a female. This species seems to be nearest *L. howei* Boll., from which, however, it may easily be separated by the characters assigned in the diagnosis.

Lithobius Beulæ sp. nov.

Diagnosis.—Angles of none of the dorsal plates produced; head but little wider than long (10.5:10); articles of antennæ 21; ocelli 9-11, in two series; prosternal teeth 2-2; spines of first legs beneath 0, 2, 1, of penult 1, 3, 3, 1, the claw armed with a single spine; posterior coxæ unarmed beneath or laterally; coxal pores 2, 3, 3, 3, round; length 8 mm.

Description.—Body, head and antennæ brown, legs paler; polished; dorsum uniformly sparsely pilose with short hairs, hairs of venter more scattered; head subglabrous; legs, prosternum and prehensorial feet sparsely pilose; antennæ proximally with but few hairs or subglabrous, distally rather densely pilose; genital and anal segments clothed below with long hairs.

Head cordiform, posterior border truncate; a little wider than long (10.5:10); posterior lateral borders depressed; impressed on posterior portion with two longitudinal diverging sulci, each with a tendency to split into two lines anteriorly.

Ocelli in a linear patch, 9-11 in number, arranged in two series (1+3, 5-1+4, 6).

Antennæ short, articles 21, mostly short, the ultimate long and cylindrical.

Prosternal teeth 2-2, pale, acute.

Principal dorsal plates all margined laterally and caudally; the lateral and posterior borders, especially in the anterior plates, depressed, the dorsum within border strongly arched, bisulcate; posterior borders of lesser plates all straight, of principal ones gently sinuate, none produced.

Spines of the first legs $\frac{0, 0, 1, 1(2), 1}{0, 0, 0, 2, 1}$; of the penult $\frac{1, 0, 2, 1, 1}{0, 1, 3, 3, 1}$, the claw armed with a single spine; posterior coxæ unarmed beneath or laterally.

Coxal pores round, 2, 3, 3, 3.

Genital appendages of male small, wart-like.

Length of body, 7-8 mm.; width of 10th dorsal plate, .76 mm.; length of antennæ, 2.3 mm.

Remarks.—The description is based upon two males, both of which have lost the anal legs. The general appearance is not unlike that of *L. utahensis* Chamb., from the mountains of Utah.

Geophilus atopodon sp. nov.

Diagnosis.—Frontal plate discrete, last ventral plate narrow; anal pores present, moderately large; pleural pores 10-16 adjacent to ventral and dorsal plates; coxæ of prehensorial feet each armed with a stout tooth, the tooth of claw truncate at end; pairs of legs 49-51 (♀), claw of anal legs long (♀); length, 25 mm.

Description.—Rather robust, very gradually attenuated cephalad, more abruptly caudad; color uniformly light-brown, the legs the same, the antennæ lighter distally. Dorsal plates smooth, sparsely pilose; legs very sparsely pilose; last seven articles of antennæ densely pilose with short hairs, the proximal ones more sparsely provided with long hairs; prosternum and coxæ of prehensorial feet finely punctate.

Antennæ short, the ultimate joint reduced distally, shorter than the two preceding taken together.

Cephalic plate much longer than wide (2.5:1.9), anterior and posterior margins nearly straight, the sides curving, wider in front than behind. Frontal plate discrete, the suture V-shaped in the middle with the point directed backward. Cephalic plate back of suture impressed with a strong suture near each lateral margin and with one each side of the median line; a median sulcus extending cephalad in the V-shaped opening of the suture. Prebasal plate concealed. Basal plate as a whole more than twice wider than long (9:4), exposed portion wider than long in the ratio 9:2.25.

Claws of prehensorial feet when closed scarcely reaching the end of the first antennal article; claw armed at base with a moderately stout, truncate tooth; coxa armed with a stout tooth which is somewhat longer than that of the claw; prosternum wider than long (12:10.5), less than twice the height of the coxa, unarmed.

Dorsal scuta not sulcate or with a few of the middle ones indistinctly bisulcate; anterior præscuta short, becoming long or very long in the posterior middle region, the last ones again short.

First anterior spiracle large, vertically oval, a few following of the same shape, others round, gradually decreasing in size from the first to the last.

Anterior ventral plates with a median sulcus, some of the middle ones with a median oval area marked off laterally by semi-lunar depressions. Ventral pores numerous, in more anterior plates arranged in a median depressed area, in first middle plates in a longitudinal median band and in a narrower band cephalad of posterior margin, further back covering nearly the entire surface, although in some more or less absent from a median area while densely covering the plate elsewhere.

First pair of legs shorter and much more slender than those succeeding, legs increasing in length from the first to the last. Anal legs with a long claw.

Pleuræ of last segment with 10-16 pores arranged mostly along the margin of the ventral plate or partly covered by the latter, a number (4-5) also adjacent or somewhat overlapped by the dorsal plate. Last ventral plate a little wider than long, about as wide as the one preceding.

Pairs of legs 49-51. Length, 25 mm.; greatest width, 1.2 mm; length of antennæ, 2 mm.; of anal legs, .9 mm.

Remarks.—The types are two adult females. They are not very closely related to any other known species.

Parajulus neomexicanus sp. nov.

Diagnosis.—First dorsal plate smooth, its sides not at all striate; other segments strongly striate below. Repugnatorial pores small, free from the transverse suture. Last dorsal plate blunt behind, not extending beyond anal valves. Pre-anal scale convexly rounded in front and behind, the curved margins meeting at an acute angle laterally. Anal valves marginate, rugose. Male: Mandibular stipes strongly produced below; the greatly enlarged first pair of legs not at all bent or hamate at end, not tuberculate; copulatory feet exposed, the anterior plate set obliquely, very wide, clavately enlarged upward, and produced backward above base posteriorly, the inner border bent inward or backward, indented below top, concealing middle and posterior piece from the front and side.

Description.—Slender, smooth and shining, glabrous. General color light-brown, transversely banded with dark-brown or blackish, a median dorsal line of same; a series of suboval light-colored spots along lower part of each side; toward dorsum within dark band of each segment a short row of light-colored, often confluent, blotches each crossed

by a network of fine dark lines; in each segment laterad of the dorsal line a short, light-colored transverse line; feet pale; first dorsal plate and vertex of head light-brown, covered with a network of fine dark-brown lines; a dark, blackish band between eyes, with within near middle two light lines diverging cephalad; a light spot mesad from the base of each antenna; clypeal region light-brown; antennæ dark.

Head at vertex with a shallow median sulcus. Antennæ in length about equaling the width of the body; pilose, the terminal articles densely so; articles long. Ocelli in a large triangular patch, about 50 in number, arranged in 8 series.

First dorsal plate smooth, not at all striate; other segments strongly striate beneath, above with numerous longitudinal wavy lines; anterior segments more strongly striate than the posterior. Posterior angle of the last dorsal plate rounded, blunt, but little produced, not extending beyond anal valves. Pre-anal scale convexly rounded in front and behind, indented in the middle behind, the two curved margins meeting at an acute angle on each side; with two long bristles, otherwise glabrous.

Anal valves glabrous, marginate; the elevate margins crossed by a series of transverse sulci; valves elsewhere roughened by numerous longitudinal rugæ.

Repugnatorial pores small, not touching transverse suture.

Legs rather short, not extending beyond sides of body, sparsely pilose, claw strong; last tarsal joint with a row of stout bristles (*pulvilli tarsales*) projecting outward on each side (♂).

Male: Stipes of mandibles strongly produced below; first pair of legs greatly enlarged, reaching anterior margin of gnathochilarium, nearly straight, not bent or at all hamate at end, very sparsely pilose, not tuberculate; coxæ of second pair of legs meeting within and produced forward into a narrow tongue-like process with a round or button-shaped appendage at end, at base of coxæ a median pit which continues forward along process as a shallow furrow; copulatory appendages exposed; anterior plate set somewhat obliquely, very wide, clavately enlarged upward, the outer or posterior border much produced backward above base, concealing other pieces from front and side, inner border indented below top, bent inward or backward, plate pilose with numerous long hairs outward from bent border and along a line below and parallel with upper margin; middle piece (as also outer one) shorter than the anterior, subtriangular in caudal aspect, acutely pointed, with fine, rather distantly placed teeth along sides which are not strongly bent or rolled, inner basal portion produced forward, a hamate process

in front of each; outer or posterior piece narrowed above, its top rounded and a little bent, bearing a long bristle, at base also one or several long bristles.

Segments 47-57. Length, 36 mm.; width, 1.9 mm.

Remarks.—The specimens studied include three adults, two males and a female, and several immature individuals. The measurements given are from the largest individual, a male.

Polydesmus sp.

Several young individuals of a species of this genus are in the collection. They are of the stage possessing only twelve segments, and thus too young for determination.